

## PATENT SPECIFICATION

302,446

Application Date: Oct. 15, 1927. No. 27,382/27.

Complete Left: July 13, 1928.

Complete Accepted: Dec. 20, 1928.



## PROVISIONAL SPECIFICATION.

## Improvements relating to Filters.

I, ARTHUR COWLAM HANDLEY, of Lee Green, Mirfield, in the County of York, a British subject, do hereby declare the nature of this invention to be as follows:—

This invention relates to filters of the open tank type which are primarily intended for use in connection with sewage and for filtering the effluent which comes from factories of various kinds such for example as dye works and chemical works.

According to this invention coir fibre mounted in suitable holders is arranged to extend transversely or transversely and longitudinally or otherwise across the tank, in any desired number of rows and interspersed between one or more rows are sand filters which may be formed by filling a space between two coir fibre filters with sand or by interposing perforated or open-work containers between two rows of coir fibre filters and filling the openwork containers with sand which will pass through the perforations in the bottom and end walls of the containers and make a seal with the adjacent portions of the tank and with other like perforated containers.

The coir fibre filters may be made in sections of a suitable size for handling and be adapted to be supported by vertical

and horizontal guides in the tank in such manner that they can be lowered into position and raised from the tank by an overhead crane or other lifting appliance when required to be changed. For this purpose the coir fibre may be contained between expanded metal sheets and held in position by means of bolts which secure the expanded sheets and coir fibre together. One or more spaces are left between two or more rows of the coir fibre filters for the reception of the sand which can be poured into such spaces until it comes level with the top of the filter. When the sand is mounted in separate containers the latter may be made in sections comprising separate containers of expanded metal which may be open at the top and provided with means for lifting and lowering them between the rows of coir fibre filter sections. The sand filters may be used at or near the delivery end of the tank or they may be distributed more or less throughout the length of the tank according to the nature of the material to be filtered.

Dated this 14th day of October, 1927.

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Penny Bank Chambers, Halifax,  
Agents for the Applicant.

## COMPLETE SPECIFICATION.

## Improvements relating to Filters.

I, ARTHUR COWLAM HANDLEY, of Lee Green, Mirfield, in the County of York, a British subject, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to filters of the open tank type which are primarily intended for use in connection with sewage and for filtering the effluent which comes from factories of various kinds such for example as dye works and chemical works.

According to this invention coir fibre mounted in suitable holders is arranged to extend across or along the tank, in any

desired number of rows and interspersed between two or more rows are sand filters which may be formed by filling a space between two coir fibre filters with sand or by interposing perforated or open-work containers between two rows of coir fibre filters and filling the openwork containers with sand which will pass through the perforations in the bottom and end walls of the containers and make a seal with the adjacent portions of the tank and with other like perforated containers.

The coir fibre filters may be made in sections of a suitable size for handling and be adapted to be supported by vertical and horizontal guides in the tank in such

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manner that they can be lowered into position and raised from the tank by an overhead crane or other lifting appliance when required to be changed. For this purpose the coir fibre may be contained between expanded metal sheets and held in position by means of bolts which secure the expanded sheets and coir fibre together. One or more spaces are left between two or more rows of the coir fibre filters for the reception of the sand which can be poured into such spaces until it comes level with the top of the filter. When the sand is mounted in separate containers the latter may be made in sections comprising separate containers of expanded metal which may be open at the top and provided with means for lifting and lowering them between the rows of coir fibre filter sections. The sand filters may be used at or near the delivery end of the tank or they may be distributed more or less throughout the length of the tank according to the nature of the material to be filtered.

In order that the said invention may be clearly understood and readily carried into effect, the same is described more fully with reference to the accompanying drawings, in which:—

Fig. 1 is a vertical section of a filter constructed in accordance with this invention, and

Fig. 2 is a horizontal section taken on line 2—2 of Fig. 1.

A indicates the coir fibre filters and B the sand filters.

In the example shown three coir fibre filters are employed, the coir fibre being

contained between expanded metal sheets *a* and held in position by means of bolts which secure the expanded sheets and coir fibre together. The two spaces between the three coir fibre filters are filled up with sand to the top of the liquid level in the filter. The tank is formed or provided with one or more inlets C, an outlet D, and an overflow E and with one or more sludge outlets if required.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A filter of the open tank type provided with coir fibre and sand filters arranged in combination substantially as described.

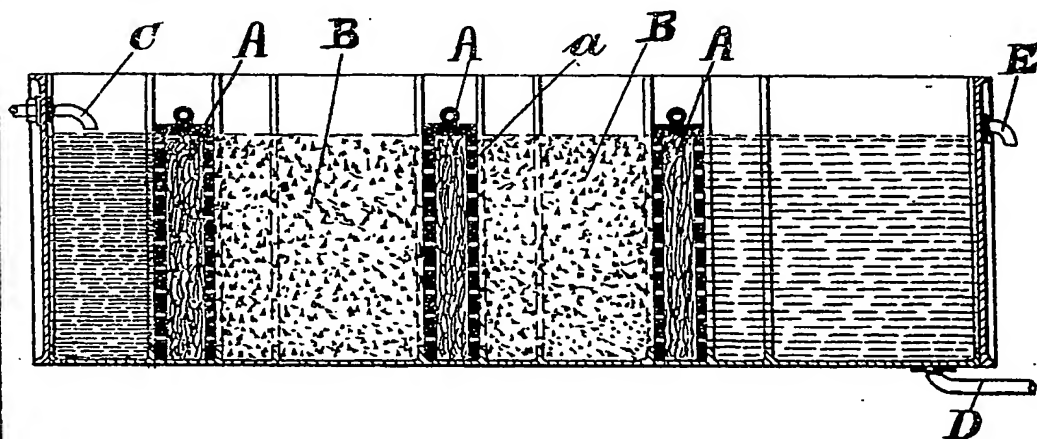
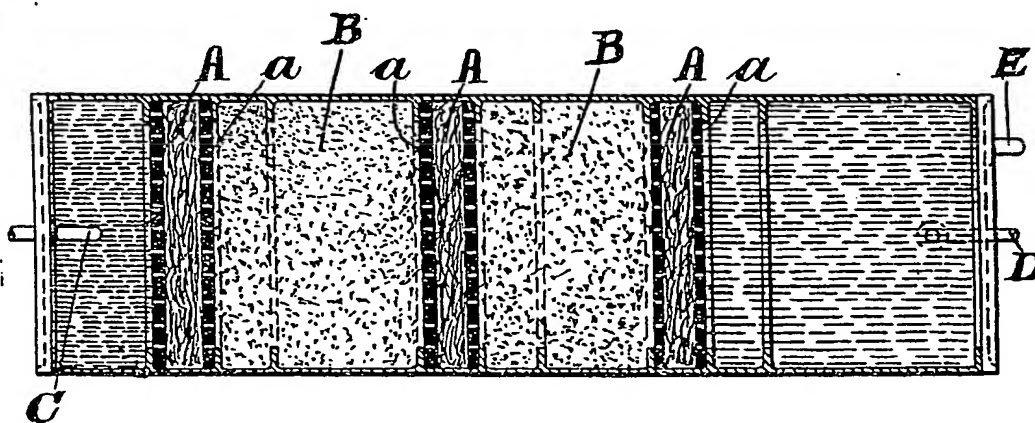
2. A filter of the open tank type wherein coir fibre mounted in suitable holders is arranged to extend across or along the tank, in any desired number of rows and interspersed between two or more rows are sand filters formed by filling a space between two coir fibre filters with sand.

3. A filter according to Claim 1 wherein the sand filters comprise openwork containers which are filled with sand and interposed between two or more rows of coir fibre filters substantially as described.

4. A filter having its parts constructed, arranged and adapted to operate substantially as hereinbefore described with reference to the accompanying drawings.

Dated this 12th day of July, 1928.

APPLEYARD & CROSSLEY,  
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Agents for the Applicant.

**FIG.1.****FIG.2.**

[This Drawing is a reproduction of the Original on a reduced scale.]

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